



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,316	03/25/2005	Takco Azuma	5077-000237/NP	8647
27572 7590 10/15/2007 HARNES, DICKEY & PIERCE, P.L.C. P.O. BOX 828 BLOOMFIELD HILLS, MI 48303			EXAMINER RASHID, DAVID	
			ART UNIT 2624	PAPER NUMBER
			MAIL DATE 10/15/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/529,316

Applicant(s)

AZUMA ET AL.

Examiner

David P. Rashid

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 March 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 325/2005, 4/3/2006, 12/7/2006/
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

All of the examiner's suggestions presented herein below have been assumed for examination purposes, unless otherwise noted.

#### ***Amendments***

1. This office action is responsive to the preliminary specification amendment received on 3/25/2005.

#### ***Priority***

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d) (Application # JP2003-123204, filed 3/25/2005), which papers have been placed of record in the file.

#### ***Drawings***

3. The following is a quote from 37 CFR 1.84(h):

All views of the drawing must be grouped together and arranged on the sheet(s) without wasting space, preferably in an upright position, clearly separated from one another, and must not be included in the sheets containing the specifications, claims, or abstract.

4. The drawings are objected to under 37 CFR 1.84(h) for failing to group together and be arranged on the sheets without wasting space – suggesting combining FIG. 5 and FIG. 8 on one sheet.

#### ***Claim Rejections - 35 USC § 101***

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Art Unit: 2624

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See *Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

6. **Claim 13** is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. **Claim 13** defines "[a] program" embodying functional descriptive material. However, the claim does not define a computer-readable medium or memory and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). That is, the scope of the presently claimed "[a] program" can range from paper on which the program is written, to a program simply contemplated and memorized by a person. The examiner suggests amending the claim to embody the program on "computer-readable medium" or equivalent in order to make

Art Unit: 2624

the claim statutory. Any amendment to the claim should be commensurate with its corresponding disclosure.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. **Claims 1 – 2, 4 – 14, and 16** are rejected under 35 U.S.C. 102(b) as being anticipated by Daugman (US 5,291,560 A).

Regarding **claim 1**, Daugman discloses a counterfeit eye discrimination method (FIG. 1) comprising the steps of:

receiving image data of an image (FIG. 1, element 10) including an eye (FIG. 2); and

detecting presence or absence of roughness (roughness is a measurement of a small-scale variation; thus the small-scale variation between the stored reference code of an original iris and that of the present code in computing Hamming distance is a measure of “roughness”) in the image by image processing (FIG. 1, element 26; FIG. 6) to the image data;

wherein the eye is judged (FIG. 1, element 28) to be a counterfeit eye (a counterfeit eye when the image is of an eye of an imposter in FIG. 6) when roughness is detected in the image.

Art Unit: 2624

Regarding **claim 2**, Daugman discloses the counterfeit eye discrimination method of claim 1, wherein the image processing includes the steps of:

performing band limitation (“quadrature bandpass filters” in Col. 3, lines 52 – 55; FIG. 3; FIG. 4) to the image data; and

extracting a predetermined feature (FIG. 4C to generate the code when FIG. 4B Gabor filter above or below 0 creating the Hamming distance) from the band-limited image data, wherein the presence or absence of roughness is detected (FIG. 1, element 26; FIG. 6) using the extracted feature data.

Regarding **claim 4**, Daugman discloses the counterfeit eye discrimination method of claim 2, wherein pixel coordinate values (“polar coordinate system” Col. 5, lines 1 – 11) are used in combination with pixel values (“1” or “0” in FIG. 4C) in the extraction of the predetermined feature (FIG. 4C to generate the code when FIG. 4B Gabor filter above or below 0 creating the Hamming distance); code at the top of FIG. 2).

Regarding **claim 5**, Daugman discloses the counterfeit eye discrimination method of claim 2, wherein a center of a pupil or an iris is used in combination (the polar coordinate system is centered around the center of the pupil and iris, thus the center of the pupil and iris being “used”) with pixel values (“1” or “0” in FIG. 4C) in the extraction of the predetermined feature (FIG. 4C to generate the code when FIG. 4B Gabor filter above or below 0 creating the Hamming distance).

Regarding **claim 6**, Daugman discloses the counterfeit eye discrimination method of claim 2, wherein a high-pass filter or a band-pass filter (“quadrature bandpass filters” in Col. 3, lines 52 – 55; FIG. 3; FIG. 4) is used in the band limitation.

Art Unit: 2624

Regarding **claim 7**, Daugman discloses the counterfeit eye discrimination method of claim 2, wherein the extraction of the predetermined feature (FIG. 4C to generate the code when FIG. 4B Gabor filter above or below 0 creating the Hamming distance) is performed to a vicinity (FIG. 2 where it is in a “vicinity” of both the iris and pupil region) of an iris region or a pupil region.

Regarding **claim 8**, Daugman discloses the counterfeit eye discrimination method of claim 2, wherein the extraction of the predetermined feature (FIG. 4C to generate the code when FIG. 4B Gabor filter above or below 0 creating the Hamming distance) is performed to a region on or in a vicinity (the scanning areas in FIG. 2 are in a “vicinity” of a line passing through both the center of a pupil and iris) of a line passing through a center of a pupil or a center of an iris.

Regarding **claim 9**, Daugman discloses the counterfeit eye discrimination method of claim 1, wherein the image processing includes the steps of:

performing frequency analysis (“quadrature bandpass filters” in Col. 3, lines 52 – 55; FIG. 3; FIG. 4) to the image data;

extracting a predetermined feature (FIG. 4C to generate the code when FIG. 4B Gabor filter above or below 0 creating the Hamming distance creating the Hamming distance) from the frequency-analyzed data.

Regarding **claim 10**, Daugman discloses a counterfeit eye discrimination method (FIG. 1) comprising the steps of:

receiving image data of an image (FIG. 1, element 10) including an eye (FIG. 2);

performing band limitation (“quadrature bandpass filters” in Col. 3, lines 52 – 55; FIG. 3; FIG. 4) to the image data;

Art Unit: 2624

extracting a predetermined feature (FIG. 4C to generate the code when FIG. 4B Gabor filter above or below 0 creating the Hamming distance) from the band-limited image data; and recognizing whether the eye is a counterfeit eye or a living eye (Col. 2, lines 45 – 49) based on data of the extracted feature.

Regarding **claim 11**, Daugman discloses the counterfeit eye discrimination method of claim 10,

wherein in the recognition step,

distributions (FIG. 10; FIG. 6) of the predetermined feature of living eye images (“Authentics” in FIG. 6) and counterfeit eye images (“Imposters” in FIG. 6) are respectively prepared beforehand,

a distance to data of the extracted feature (FIG. 4C to generate the code when FIG. 4B Gabor filter above or below 0 creating the Hamming distance) from the feature distribution of the living eye images and a distance thereto from the feature distribution of the counterfeit eye images are calculated (all of the necessary distances calculations in FIG. 6), and

the eye is judged to be an eye belonging to the distribution (FIG. 6 with the cross-hatched rate areas), from which the calculated distance is the shorter between the living eye and the counterfeit eye (e.g. a Hamming distance of 0.2 is a shorter distance to a probable authentic image, the longer distance would be to an imposter image).

Regarding **claim 12**, claim 10 recites identical features as in claim 12. Thus, references/arguments equivalent to those presented above for claim 10 are equally applicable to claim 12.



Art Unit: 2624

Regarding **claim 13**, claim 10 recites identical features as in claim 13. Thus, references/arguments equivalent to those presented above for claim 10 are equally applicable to claim 13.

Regarding **claim 14**, Daugman discloses an iris authentication method (FIG. 1) comprising the steps of:

performing iris authentication (FIG. 1; FIG. 1, element 28) based on image data of an image (FIG. 1, element 10) including an eye (FIG. 2); and

performing the counterfeit eye discrimination method of claim 1 or claim 10 to the image data when a subject is authenticated as a person himself or herself (“confirming personal identity” in Col. 4, lines 27 – 29; Col. 13, lines 26 – 41) in the iris authentication step.

Regarding **claim 16**, Daugman discloses an image discrimination method (FIG. 1) comprising the steps of:

receiving image data of an image (FIG. 1, element 10); and

detecting presence or absence of roughness (roughness is a measurement of a small-scale variation; thus the small-scale variation between the stored reference code of an original iris and that of the present code in computing Hamming distance is a measure of “roughness”) in the image by image processing (FIG. 1, element 26; FIG. 6) to the image data,

wherein the image is judged to be an image projecting a printed matter (Col. 6, lines 58 – 61 wherein a photograph is “printed matter”) when roughness is detected in the image.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Daugman (US 5,291,560 A) in view of Flom et al. (US 4,641,349 A).

Regarding **claim 3**, while Daugman discloses the counterfeit eye discrimination method of Claim 2, Daugman does not teach wherein the predetermined feature is one of or a combination of two or more of moment, central moment, skewness and kurtosis of pixel values.

Flom teaches what is considered one of the first (if not the first itself) iris recognition system wherein a predetermined feature is using the central moment (Col. 13, lines 20 – 40).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the predetermined feature of Daugman to include using the central moment as taught by Flom as “the present invention provides an identification technique based upon the recognition of the unique features of the iris and pupil, referred to herein as "iris identification".”, Flom, Col. 1, lines 45 – 48.

11. **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Daugman (US 5,291,560 A) in view of Jones et al. (US 2002/0107801 A1).

Regarding **claim 15**, while Daugman discloses a counterfeit printed matter discrimination method, characterized by comprising the steps of:

Art Unit: 2624

receiving image data of an image (FIG. 1, element 10) of a photograph or real eye (FIG. 2); and

detecting presence or absence of roughness (roughness is a measurement of a small-scale variation; thus the small-scale variation between the stored reference code of an original iris and that of the present code in computing Hamming distance is a measure of “roughness”) in the image by image processing (FIG. 1, element 26; FIG. 6) to the image data,

wherein the photograph or real eye is judged to be a counterfeit printed matter (Col. 6, lines 58 – 61 wherein a photograph would be “counterfeit printed matter”) when roughness is detected in the image, Daugman does not teach wherein the image is of a bill or valuable paper.

Jones discloses an automated document processing system using full image scanning that teaches wherein the image is of a bill or valuable paper (FIG. 4C)

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the image of Daugman to include a bill or valuable paper as taught by Jones “to provide a document and currency processing system capable of processing documents utilizing full image scanning and a currency discriminator.”, Jones, paragraph [0003].

### ***Conclusion***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David P. Rashid whose telephone number is (571) 270-1578. The examiner can normally be reached Monday - Friday 8:30 - 17:00 ET.

Art Unit: 2624

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571) 272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David P. Rashid/  
Examiner, Art Unit 2624

David P Rashid  
Examiner  
Art Unit 2624



**VIKKRAM BALI**  
**PRIMARY EXAMINER**